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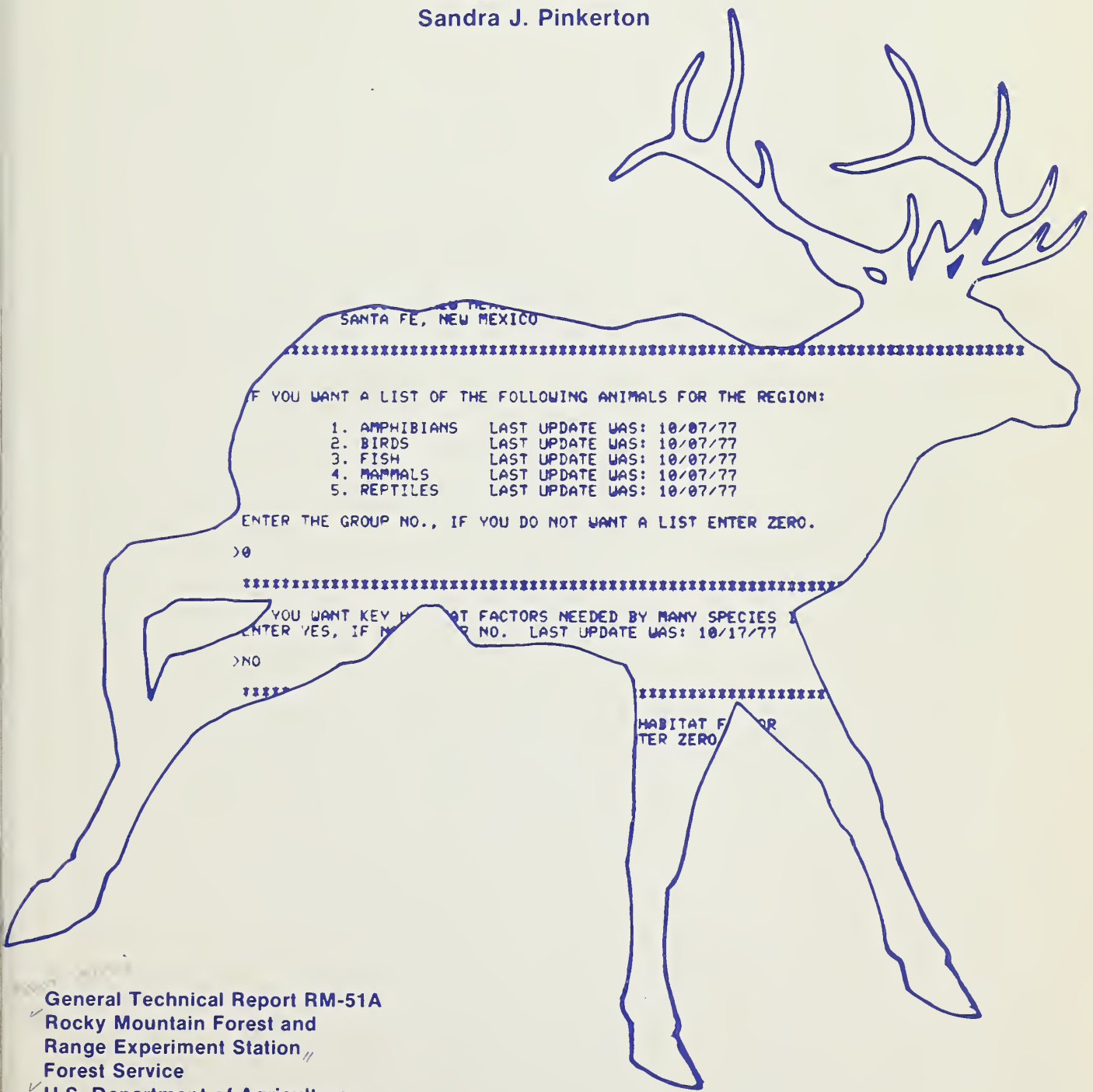
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RUN WILD—For the UNIVAC 1100 Series

Implementation and Maintenance

Wilson B. Casner
Barbara Kulongowski
David R. Patton
Sandra J. Pinkerton



General Technical Report RM-51A
Rocky Mountain Forest and
Range Experiment Station
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Abstract

RUN WILD is a storage and retrieval system designed for wildlife habitat information in Arizona and New Mexico. Program language is UNIVAC FORTRAN V. The system contains programs to create and update 11 wildlife files. Minimal knowledge of computers is required to implement the system, and little training is necessary for the user to access the files. Disc files which allow large storage space and direct addressing of records are used. The number of files, file sizes, and file structures are set.

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RUN WILD — For the UNIVAC 1100 Series

Implementation and Maintenance

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Implementation and Maintenance

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There is a need for ready access to wildlife information that will not involve extensive and repetitive literature searches. The RUN WILD System, a set of programs that are used independently to build 11 information files and a single program called RUN WILD to retrieve information from the files, offers an alternative which would allow the user to access wildlife information from a computer terminal.

This supplement to General Technical Report RM-51 describes the RUN WILD System so that, with a minimum knowledge of computers, the system can be implemented. Each program is documented, and the use and limitations of each one is discussed. Each program and file is assigned a name and a number, and is referred to by either.

The paper is for potential users with some electronic data processing background and is intended to help them decide whether the RUN WILD System meets their needs as well as to instruct them in system implementation.

Introductory Information

The RUN WILD System consists of four programs to create 11 wildlife information files and a fifth program, also called RUN WILD, that will list information from these files according to user responses to the program. The programs are written for use on the UNIVAC 1100 series computers.

The RUN WILD program is written in conversational mode, which means the program and user interact through a terminal keyboard and printer. Files are limited in size only because they were programmed this way. The use of core storage is minimized by using mass (disc) storage. Current limits on lengths of files are set, but they may be expanded or contracted. The user may create files or may add to those of other users, given the authority and the directions.

Wildlife Information Files

The 11 files used by PROGRAM RUN WILD are listed below with brief descriptions. The file numbers are assigned by the program.

| File No. | File Name | Description |
|----------|--------------------------------|--|
| 12 | Vegetation Types | A file containing a set of records for each vegetation type. There are 31 records per set. The first record for a set contains a hierarchy number and a name for a vegetation type. Records 2-31 for a set contain the same hierarchy number and up to 750 codes for animals in the vegetation type. |
| 13 | Key Habitat Factors | Similar in structure to the vegetation file but with a sequence number substituted for a hierarchy number, and the name of habitat factor important to a number of animals substituted for a vegetation type name. |
| 7 | Amphibians (Animal Group 1) | A disc file containing a name record for each amphibian, each record containing the group number (in this case 1), and assigned animal index number and its corresponding animal name. The first record contains number of animals and date of last update. |
| 8 | Birds (Animal Group 2) | Same as for file number 7, substituting birds for amphibians and group number 2 for group number 1. |
| 9 | Fish (Animal Group 3) | Group number = 3 Group = Fish |
| 10 | Mammals (Animal Group 4) | Group number = 4 Group = Mammals |
| 11 | Reptiles (Animal Group 4) | Group Number = 5 Group = Reptiles |

| | | Program No. | Program Name | Description |
|----------------------------------|---|----------------|-----------------|---|
| 14 Management Information | A disc file containing exactly 60 card images for each animal species. The first image contains an animal group number, index number, and name. The next 59 images contain management information for the species. | 1 | VGTFAC | Used to create or update the Vegetation Type, Key Habitat Factors, County and Forest files from cards. For simplicity, an update run is the same as a create run. Entire deck is read in each time with numbers describing file number (12, 13, 16 or 17), number of vegetation types (Key Habitat Factor, Counties or Forests) and date of the update. |
| 15 Bibliographical References | A disc file associated with the management file by numbers which flag information in the management file that was obtained from the numbered references. A code R1 following information in the management file means information for the animal species was obtained from reference number 1 for that species. The file contains a set of references for each animal species. Each set contains 61 records, the first of which identifies the animal by group and species index number and name. The last 60 contain bibliographical references in numbered sequence. More than one record may be used for a reference, if required. | 2 | GROUPS | Used to create or update the five files containing names and index (sequence) numbers of animal species in each file. Group 1 (file 7) is amphibians. Group 2 (file 8) is birds. Group 3 (file 9) is fish. Group 4 (file 10) is mammals. Group 5 (file 11) is reptiles. Again, for simplicity, an update is a run of an entire group identifying file number, number of records, and date. One or more files can be updated in a run. |
| 16 County | Similar in structure to the vegetation types file but with a sequence number substituted for a hierarchy number and corresponding county name, followed by the animal group and species index numbers for the animals living in that county. | 3 | MGMT | Used to create or update the Management File. Input is from cards. The first card is a header card containing a code identifying type of update and the number of species currently in the file (on creation, this would be zero). The code is 'ADD' for additions or 'CHG' for changes. Changes come first. For additions, this card is followed by the 60-card management deck(s) for the species being added. This deck (or decks) is followed by a '9' card (9 in column 1). For changes, the header card contains the code 'CHG' and the number of species in the file, followed by one or more 60-card decks containing the change(s), and then followed by a blank card. |
| 17 Forest | Similar to the County file but contains the group and species index numbers for animals that live within the given forest boundary. | | | |

Detailed instructions to create or update these files appears in Appendices A-D. Brief descriptions of programs to create or update files follows.

Creating or Updating Wildlife Information Files

The four programs used to create the 11 previously mentioned files are described below. They have both a program name and number. It must be explained here that the user can choose other ways of updating or even creating files. Some computer system editing routines might be more efficient.

| | | |
|---|------|--|
| 4 | MNRF | Used to create or update the Reference File. Input is from cards. The first card indicates whether the cards following are changes or additions. Changes must come first. This card also indicates how many species are in the file (on creation, this would be zero). Then comes the set of reference cards for one or more species each followed by a blank (maximum of 60 cards for a species). |
|---|------|--|

More detailed information on these programs including detailed descriptions of input cards and listing of the programs is contained in Appendices A to D. PROGRAM RUN WILD is listed in Appendix E.

Advantages of the RUN WILD System

The type of information placed in the RUN WILD files was determined after discussion with wildlife biologists and represents information many others could use.

Files, programs and subroutines to manipulate these files can be added easily, since the RUN WILD program is modular. Small programs can be written to extract information for any of the files independently of PROGRAM RUN WILD.

Technicians can be easily trained to implement and maintain the system. Simplified, card oriented procedures are used, where corrections and additions to files are made on cards before making changes on disc. Patterns for file maintenance are easily established.

Given some EDP knowledge, one can simplify data preparation procedures for some files. An example is the reproduction of the animal name cards in the five group files (7-11) to prepare the first card for each species in the management and reference files. Also, to create the vegetation type, animal species cross reference cards in the VEGETATION TYPE file, the vegetation types were compiled by hierarchy numbers for each species from the management file, and a small program called CRRF (cross reference) was used to punch cards containing names by code number in each given vegetation type. The same was done for counties and forests.

Use of mass-storage-direct access files allows access to a given record from any one file without searching for it. It also allows large files to be used without defining large arrays in core storage.

Limitations

The use of mass storage disc files creates a problem in that such files are not always available when needed. One or more files may be unloaded to tape, and unless the status of the files is checked and assignments made for any that are unloaded before using the RUN WILD program, a run of the program will be unsuccessful. If the automatic file assignments made in PROGRAM RUN WILD (calls to ERTRAN) were removed and assigns of the 11 files were done prior to execution, this limitation would not exist. An alternative to having system resident disc files is described in Appendix F.

Some users might prefer less card handling in updating files. More sophisticated updating, such as use of a file editor, is an alternative.

Since it is necessary to know exactly where to address a given record in any file, size limitations (60-record limits in management files, etc.) which can be increased were set. Even with these limits, if all information in all files is requested, a lot of paper, computer time and user time would be wasted. It is important that the user be very selective.

Persons wishing to use the RUN WILD PROGRAM in batch mode could use the subroutines in the program with few changes to access information, but they would have to rewrite the main program.

The file numbers (7-17) selected might be unsatisfactory on other systems or might be limiting to the user who wants more than five animal group files, since file numbers are used as defined in the program; wherever a read, write, or file definition occurs using these numbers, they would have to be changed to fit user or system requirements.

Appendix A

PROGRAM VGTP

This program is used for creating or updating the Vegetation Types File (No. 12), the Key Habitat Factors File (No. 13), the Counties File (No. 16), and the Forests File (No. 17). All four files will contain records of the same structure. The first input card for each Vegetation Type (Habitat Factor, County, or Forest), will contain an ID number (or sequence number) and a name. One or more cards following it (maximum = 50) will contain the ID or sequence number and a series of 1 to 15 animal group-species index pairs per card. These numbers will associate the particular Vegetation Type, Key Habitat Factor, County, or forest with the series of animal species. Group numbers will be 1-5, where 1 = Amphibians, 2 = Birds, 3 = Fish, 4 = Mammals, 5 = Reptiles. The species numbers will be sequential index numbers of animals within groups.

Input to Program for Creating Files

- Card 1 — Contains file number (12, 13, 16 or 17) in columns 1 and 2.
- Card 2 — Contains number of Vegetation Types, Key Habitat Factors, Counties, or Forests in columns 1-5 right justified and the creation date in the form MM/DD/YY in columns 6-13.
- Card 3 to end — A series of number-name cards, each followed by a series of association (with animal species) cards.

Following each number-name card with no associations will be a blank card. Also, following the last association card, where the last association ends in column 80, will be a blank card. If a last association card does not use through column 80, a blank trailer card will not be used. All available space for coding associations must be used without blank fields between associations.

| Card No. 3 | Card Columns | Variable Name | Variable Description |
|------------|--------------|---------------------------------|---|
| | 1-6 | IDN0 | If vegetation types file, this is hierarchy number. If any of the three other files, it's a sequence number right justified in columns 1-3. (F6.3) |
| | 7 | — | Blank |
| | 8-79 | NAME | Name of vegetation type, key habitat factor, county or forest. (12 A6) |
| Cards 4+ | 1-6 | IDN0 | This number matches the IDN0 on card 3 for a vegetation type, key habitat factor, county or forest. (F6.3) |
| | 7-20 | — | Blank |
| | 21 | NGRN0 (1) | The group number of a first animal associated with the vegetation type, key habitat factor, county or forest. (I1) |
| | 22-24 | NSPN0 (1) | The species index number of a first animal associated with the vegetation type, key habitat factor, county or forest. (I3) |
| | 25-80 | NGRN0 (2) NSPN0 (2), etc. | A series of group-species numbers as described in columns 21-24 giving other associations. There may be up to 15 such associations and as many as 50 cards to give up to 750 associations per item. |

Deck Set-up for Creating Files

1. **Creating one file**—Card 1, Card 2, Cards 3 to end, extra blank card on end.
2. **Creating 2 or more files**—same as 1, but following extra blank card a Card 1, Card 2, Cards 3 to end for next file, extra blank on end.

Deck Set-up for Updating Files

1. Simply make changes necessary on Card 2. Add new cards for new types and associations to end of deck, make any changes in existing associations (either adding to, deleting, or replacing existing information on association cards).
2. Re-create file(s) according to 1 or 2 under "Deck Set-up for Creating Files".

Disc File Structure

1. The first record of each file contains the number of elements, (i.e., Vegetation Types, Key Habitat Factors, Counties, or Forests) and the date of creation or update.
2. There will be 31 records for each element, the first of which will be a number-name record for the element. The next 30 will contain animal group-species association pairs or numbers.

Example:

1st record: 111.000 Alpine Tundra

2nd record: 111.000 1 5

Means that animal number 5 in group 1 (amphibians) is found in Alpine Tundra.

As many as 25 associations per record for 30 records (total of 750) may be made with a single element. All 750 are accounted for even if they are blank or zero, (i.e., each element has 31 records in its file).

Disc File Record Structure

Vegetation Type, Key Habitat Factors, County, Forest Files

Files No. 12, 13, 16, 17

| Record No. | Columns | Variable Name | Variable Description |
|------------|---------|---------------------------------|--|
| 1 | 1-6 | NRVF | Equals number of records in the file. There are 31 records for each vegetation type, key habitat factor, county, or forest, plus 1 more for this record. NRVF is calculated by the program creating the file. (I6) |
| | 7-14 | ND1, ND2 | Date of latest update in the form MM/DD/YY. (2A4) |
| 2 | 1-8 | IDN0 | Hierarchy number or sequence number of vegetation type, key habitat factor, county or forest. (F8.4) |
| | 9-13 | NRECNO | The number of the record within the file. (I5) |
| | 14-17 | NASS | Number of animals presently associated with the item within the file. Maximum equal 750. (I4) |
| | 18-79 | NAME | Name of vegetation type, key habitat factor, county or forest. (12A6) |
| 3+ | 1 | NGRNO (1) | Group number of first animal associated with the vegetation type, key habitat factor, county or forest. (I1) |
| | 2-5 | NSPN0 | Species number of first animal associated with the vegetation type, key habitat factor, county or forest. (I4) |
| | 6-125 | NGRNO (2) NSPN0 (2), etc. | More associations as described in columns 1-5. There are 25 per record, 30 records. There are 750 associations, many of them zero with no association yet determined. |

PROGRAM TO CREATE VEG. TYPE,KHABF,COUNTY,FOREST FILES

```

        DIMENSION NSC1(6),NCM1(6),NGRP(750),NSPEC(750)
C --- NU : FILE NO.=12,13,16, OR 17 FOR EITHER VEG. TYPES, KEY HAB.
C --- FAC.'S, COUNTIES, OR FORESTS.
        1 READ (5,500,END=999) NU
        500 FORMAT (I2)
        DEFINE FILE NU(20000,125,E,I)
        I=1
C --- IREC : NO. OF VEG. TYPES, KEY HAB. FAC.'S, COUNTIES, OR FORESTS.
C --- ND1,ND2 : DATE OF THIS UPDATE IN FORM MM/DD/YY.
        READ (5,11) IREC,ND1,ND2
        11 FORMAT (I5,2A4)
C --- NRVF : PROGRAM DEFINED NO. OF RECORDS TO BE ON DISK.
        NRVF=IREC*31+1
        NSC1(1)=6H
        WRITE (NU'I,16) NRVF,ND1,ND2
        16 FORMAT (I6,2A4,111X)
        WRITE (6,17) NRVF,ND1,ND2
        17 FORMAT (1X,I6,2A4,111X)
        INP=5
C --- NGRP(750),NSPEC(750) : ARRAYS CONTAINING A GROUP NO. AND A SPECIES
C --- NO. FOR EACH ANIMAL (MAX=750) THAT IS ASSOCIATED WITH EACH VEG.
C --- TYPE, KEY HAB. FAC., ETC.
        10 DO 6 K=1,750
            NGRP(K)=0
            NSPEC(K)=0
        6 CONTINUE
C --- N1,N2 : LIMITS OF NO. OF GROUP-SPECIES CODES TO BE READ FROM A
C --- CARD AT A GIVEN TIME. CARD 1 N1=1,N2=15 CARD 2 N1=16,N2=30,ETC.
        N1=1
        N2=15
C --- ANUM1,ANUM : HIERARCHY OR ID NO.
C --- NSC1,NCM1 : SCIENTIFIC AND COMMON NAMES OF VEG. TYPE, ETC.
C --- READ A HIERARCHY OR ID NO. AND A VEG. TYPE, KEY HAB. FAC., ETC.
C --- NAME.
        READ (INP,30) ANUM1,NSC1,NCM1
        30 FORMAT (F6.3,2X,12A6)
C --- EXTRA BLANK TRAILER CARD SEPARATES ONE FILE UPDATE FROM ANOTHER.
        IF (NSC1(1).EQ.6H ) GO TO 1
        20 READ (INP,57) ANUM,(NGRP(J),NSPEC(J),J=N1,N2)
        57 FORMAT (F6.3,14X,15(I1,I3))
C --- BLANK TRAILER CARD SEPARATES A COMPLETELY FILLED ASSOCIATION CARD
C --- AT END OF ONE SET FROM NAME CARD FOR NEXT SET.
        IF (ANUM.LE.0.0) GO TO 60
C --- CHECK FOR END OF SET OF ASSOCIATIONS.
        DO 40 J=N1,N2
            IF (NGRP(J).EQ.0) GO TO 50
        40 CONTINUE
        N1=N1+15
        N2=N2+15
        GO TO 20
C --- N3 : PROGRAM DEFINED NO. OF ANIMALS ASSOCIATED WITH A VEG. TYPE,
C --- KEY HAB. FAC., ETC.

```

```

C --- END OF SET OF ASSOCIATIONS CARDS BY UNFILLED CARD.
50 N3=J-1
   WRITE (6,52) ANUM1,I,N3,NSC1,NCM1,(NGRP(K),NSPEC(K),K=1,N3)
52 FORMAT (1X,F8.4,I5,I4,12A6,36X,12(/,1X,25(I1,I4)))
   WRITE (NU'I,51) ANUM1,I,N3,NSC1,NCM1,(NGRP(K),NSPEC(K),K=1,750)
51 FORMAT (F8.4,I5,I4,12A6,36X,30(/,25(I1,I4)))
   GO TO 10
C --- END OF A SET OF ASSOCIATIONS CARDS BY BLANK TRAILER.
60 N3=N2-15
   IF(N3.LE.0) N3=0
   N4=N3
   IF (N3.LE.0) N4=1
   WRITE (6,52) ANUM1,I,N3,NSC1,NCM1,(NGRP(K),NSPEC(K),K=1,N4)
   WRITE (NU'I,51) ANUM1,I,N3,NSC1,NCM1,(NGRP(K),NSPEC(K),K=1,750)
   GO TO 10
999 CALL EXIT
   END

```

Appendix B

PROGRAM GRPS

This program is used to create or update the groups-species files. Each vertebrate group (No. 1-5) has its own group-species file (No. 7-11). For example, Group 1 is Amphibians, and its group-species file is No. 7, Group 3 is Birds and its group-species file is No. 8, and so on. Each group-species file is simply a numbered listing of the species in that group. Therefore, files 7-11 will contain records of the same structure. Each species card contains the group number, species number, common name and scientific name. Group numbers are 1-5, where 1 = Amphibians, 2 = Birds, 3 = Fish, 4 = Mammals, 5 = Reptiles.

Input to Program for Creating a Group-Species file

Card 1 — Contains a file number (7-11) right justified in columns 1 and 2.

Card 2 — Contains the number of species within that particular group in columns 1-5 right justified, and the creation date of the file in the form MM/DD/YY in columns 6-13.

Card 3 to end —

| Card Columns | Variable Name | Variable Description |
|--------------|---------------|--|
| 1 | NGRN0 | Group number of this animal. Always the same for a given file. It is 1-5 depending on file number. (I1) |
| 2-4 | NSPN0 | A sequence number assigned to the animal species. It will always be the same once assigned, since this number is used for cross referencing with files 12, 13, 14, 15, 16 and 17. (I3) |

| | | |
|------|------|------------------------|
| 5 | — | Blank |
| 6-77 | NAME | Name of animal. (12A6) |

Deck Set-up for Creating Files

1. Creating only one file—Card 1, Card 2, and Cards 3 to end of that group.
2. Creating two or more files—same as 1, but after the last species in a group, a next set of cards 1, 2, 3, etc.. All five group files can be created in a single run.

Deck Set-up for Updating Files

1. Simply make changes necessary on Card 2 (adjust the number of species that will now occur in the file if this will change because of additions or deletions, and change to new date). After making necessary corrections or additions, add the deck of species cards.
2. Re-create file(s) according to 1 or 2 under "Deck Set-up for Creating Files".

Disk File Structure

1. First record of each file contains the number of species in that group file and the date of creation or update.
2. There is one record for each species, containing group number, species index number, common name, and scientific name.

Disc File Record Structure

Animal Group Files

Files No. 7-11

| Record No. | Columns | Name | Variable Description |
|------------|---------|-------------|---|
| 1 | 1-5 | NSIG | No. of species in the group file. Equals number of records in file (I5) |
| | 6-13 | ND1 and ND2 | Date of latest update in the form MM/DD/YY. (2A4) |
| 2+ | 1 | N0GRP | Animal group number (I1) |
| | 2-5 | N0SP | Animal species number (I4) |
| | 6-77 | NAME | Name of animal (12A6) |

PROGRAM TO CREATE ANIMAL GROUPS

```

        DIMENSION NSC(6),NCM(6)
C --- J=FILE NO. 7,8,9,10, OR 11 FOR AMPHIBIANS, BIRDS, FISH, MAMMALS,
C --- OR REPTILES.
      1 READ (5,500,END=999) J
    500 FORMAT (I2)
        DEFINE FILE J(750,80,E,I)
C --- NSIG=NO. OF ANIMALS IN FILE.
C --- ND1,ND2=UPDATE DATE.
      READ (5,5) NSIC,ND1,ND2
      5 FORMAT (I5,2A4)
C --- I=RECORD NO. OF RECORD BEING WRITTEN.  IT'S AUTOMATICALLY
C --- INCREMENTED.
      I=1
      WRITE (J,I,6) NSIG,ND1,ND2
      6 FORMAT (I5,2A4,67X)
      DO 20 K=1,NSIG
C --- NOGRP=GROUP NO.  NOSPC=SPECIES NO.
C --- NSC,NCM=NAME OF ANIMAL.
      READ (5,10) NOGRP,NOSPC,NSC,NCM
     10 FORMAT (I1,I3,1X,12A6,3X)
      WRITE (J,I,15) NOGRP,NOSPC,NSC,NCM
     15 FORMAT (I1,I4,12A6,3X)
     20 CONTINUE
      GO TO 1
    999 CALL EXIT
      END

```

Appendix C

PROGRAM MGMT

This program is used for creating or updating the Management File (No. 14). The first input card for a species will contain the group-species numbers and the name of the animal. The cards following it (total=59) will contain the management information in the categories of general distribution, protection status, vegetation types, food habits, cover requirements, key habitat factors, and management practices. Group numbers are 1-5, where 1 = Amphibians, 2 = Birds, 3 = Fish, 4 = Mammal, 5 = Reptile. The species numbers are species index numbers of animals within groups. For our purposes, a complete list of animals for each group was developed and put in alphabetic order by genus. The resulting order gave us our index numbers.

Input to Program for Creating File

Card 1 — Contains the type of update (Add or CHG) in columns 1-3 and the number of species currently in the file in columns 4-7, right justified. For the first run, this number would be zero.

Card 2 — Contains group-species numbers and name of the animal. This is the first card of a 60-card animal species management deck.

Cards 3-61 — The remainder of the species management deck. The deck for a species **must** have 60 cards, with all of the information organized as shown on the following card layout. Where information is incomplete, all cards must occur even if left blank.

Each record for an animal species in the disc management file is the image of its corresponding input card as described above. Card images 2-61 for the first species in the file become records 1-60 on disk. There will be a 60-record set for each animal species for which management information exists.

Card Input Layout Management File File No. 14

| Card No. | Card Column | Variable Name |
|----------|-------------|---|
| 3 | 2-21 | Contains the words, 'GENERAL DISTRIBUTION'. |
| | 7-15 | The word 'COUNTIES' |
| 4-7 | 18-79 | Number codes for the Counties where this species occurs. (15(I2, 2X),I2) |
| 8 | 7-23 | The words 'NATIONAL FORESTS' |
| | 25-80 | Number codes for the Natural forests where this species occurs. |
| 9 | 2-80 | Number codes for the National Forests where this species occurs. |
| 10 | 2-19 | The words 'PROTECTION STATUS' |
| | 21-80 | The appropriate code or word describing this species' status. |
| 11 | 7-13 | The word 'ARIZONA' |
| | 19-80 | The appropriate code or word for state status. |
| 12 | 7-16 | The word 'NEW MEXICO' |
| | 19-80 | The appropriate code or word for federal status. |
| 14 | 2-17 | The words 'VEGETATION TYPES', only. |
| 15-24 | 10-80 | The hierarchy numbers for the vegetation type this species is found in. (8(F7.3,1X),F7.3) |
| 25 | 2-12 | The words 'FOOD HABITS'. |
| 26-31 | 4-80 | Food habits information. |
| 32 | 2-19 | The words 'COVER REQUIREMENTS'. |
| 33-40 | 4-80 | Cover requirement information. (77A1) |
| 41 | 2-20 | The words 'KEY HABITAT FACTORS'. |
| 42-47 | 4-80 | Key habitat information. (77A1) |
| 48 | 2-21 | The words 'MANAGEMENT PRACTICES'. |
| 49-61 | 4-80 | Management information and comments on the species. (77A1) |

Deck Set-up for Creating File:

1. Card 1 followed by the 60-card species management deck for each species to be entered into the file.
2. After the last management deck, a card with a 9 in column one.

Deck Set-up for Updating Files:

1. To add one or more species to the management file, proceed the same as for "Deck Set Up for Creating File" with correct number of species currently in file on Card 1. At the end of the latest printout from a creation run or last update will be the message: "There are NNN groups in file.", where NNN is a number to be punched on Card 1. Management information on succeeding cards will be added to the end of the management file. A '9' card should be the last one when adding on.
2. To update management information on one or more species currently in the management file:

Card 1 — Contains the code CHG in columns 1-3 and the number of species currently in the file in columns 4-7, right justified.

Cards 1-60 for each species—Include the entire species-management deck even if only one card has been changed. The deck set-up is similar to the set-up for creating files, but the card following the management deck must be a blank. Do not use a '9' card when making changes in the current file. A '9' card is used only after additions to the end of the file; the blank card follows changes within the current file.

If both additions and changes are to be made in a single run, all changes to existing information shall be made first, then additions. Changes or adds need not be in sequential order but require all 60 cards for a species.

A sample update run might be one in which changes in information for the following animals are required:

| Group | Species |
|-------|---------|
| 1 | 3 |
| 2 | 10 |
| 1 | 25 |

Also, we might want to add a group 1, species 27.

The set-up would be:

Card No.

| | |
|---------|--|
| 1 | "CHG" in columns 1-3 and 720 in columns 4-7. (720 is present number of animals in file). |
| 2-61 | Cards for animal species number 3 in group 1. |
| 62-121 | Cards for animal 2, 10 |
| 122-181 | Cards for animal 1, 25 |
| 182 | Blank card (end changes) |
| 183 | "ADD" in columns 1-3 and 720 in columns 4-7. |
| 184-243 | Cards for animal 1, 27 |
| 244 | 9 in column 1 |

In any update, additions to the file must be made last (i.e., the 9 card must be last of the run). An update involving both changes in species already in the file and additions to the file needs only 1 CHG card (blank card following last 60 card set) and 1 ADD card (9 card following last set).

PROGRAM TO CREATE MANAGEMENT FILE

```
C --- FOR CHANGES IN INFO ALREADY IN MNGMNT FILE THE FULL 60 CARD DECK
C --- FOR A SPECIES IS REQUIRED, THE REASON BEING THAT WHEN CHANGES ARE
C --- MADE THEY SHOULD BE EXTENSIVE ENOUGH TO WARRANT A RUN. ALSO CARD
C --- INFO STAYS CURRENT WITH DISK.
      DIMENSION NA(80),NAME(65)
C --- KOUNT KEEPS TRACK OF THE NO. OF SETS THAT HAVE BEEN ADDED
      KOUNT=1
      DEFINE FILE 14(99999,80,E,I)
C --- NYTPE = ADD OR CHG   NREC = NO. OF ANIMALS CURRENTLY IN FILE.
      1 READ(5,100,END=905) NTYPE,NREC
      100 FORMAT(A3,I4)
```

```

C --- READ GROUP NO., SPECIES NO. AND ANIMAL NAME.
  5 READ(5,11,END=9999) NGRP,NSP,NAME
 11 FORMAT(I1,2X,I3,65A1,9X)
C --- BLANK TRAILER TERMINATES PRECEDING GROUP OF ADDS OR CHANGES.
  IF(NGRP.EQ.0)GO TO 1
C --- A '9' CARD TERMINATES RUN, PUTS '9' ON LAST RECORD.
  IF(NGRP.EQ.9)GO TO 200
C --- MREC=NO. OF RECORDS NOW IN FILE.
  MREC=NREC*60+1
  IF(NTYPE.EQ.3HADD)GO TO 105
C --- LOOK FOR 60 RECORD SET TO BE CHANGED.
  DO 20 J=1,MREC,60
  READ(14'I,30) N1,N2
 30 FORMAT(I1,2X,I3)
  IF(N1.EQ.NGRP.AND.N2.EQ.NSP)GO TO 40
  IF(N1.EQ.9)GO TO 999
 20 CONTINUE
C --- MAKE CHANGES.
 40 I=J
  GO TO 105
 45 DO 60 K=1,59
  READ(5,50) NA
 50 FORMAT(80A1)
  WRITE(14'I,50)NA
 60 CONTINUE
  WRITE(6,500) KOUNT
500 FORMAT(I6)
  KOUNT=KOUNT+1
  NREC=NREC+1
  GO TO 5
C --- ADD TO END OF FILE.
105 I=MREC
  WRITE(14'I,11) NGRP,NSP,NAME
  GO TO 45
999 WRITE(6,110) NGRP,NSP
110 FORMAT(1X,I1,1X,I3,' SPECIES NOT FOUND ',/)
  GO TO 905
C --- END FILE WITH '9' RECORD.
200 WRITE(14'I,205)NGRP
205 FORMAT(I1,79X)
C --- LOOP TO READ AND PRINT ANIMAL NAME RECORDS FROM FILE FOR RUN
C --- COMPLETION VERIFICATION.
905 DO 210 I=1,99999,60
  READ(14'I,50)NA
  IF(NA(1).EQ.1H9)GO TO 9
  WRITE(6,220)NA
 210 CONTINUE
 220 FORMAT(1X,80A1)
  9 J=I-1
  K=I/60
C --- PRINT IS FOR REFERENCE IN FUTURE UPDATES.
  WRITE(6,230)J,K
 230 FORMAT(1X,'RECORDS WRITTEN = ',I5,' THERE ARE ',I5,' GROUPS IN
1 FILE.')
```

```

9999 CALL EXIT
      END
```


Appendix D

PROGRAM MNRF

This program is used for creating or updating the Reference File (No. 15). The references are arranged by the species they pertain to. The first input card for a species contains the group-species index numbers and the name of the animal. Following it are the reference cards (maximum = 60). Each complete reference (references may take up several cards) is numbered. References are numbered consecutively for a species and correspond to reference index numbers (numbers prefixed by the letter R) in the management file. After the last reference card is a blank card. This is repeated for each reference set.

Input to Program for Creating Management References File (No. 15)

Card 1 — Contains a code in columns 1-3 which is either "ADD" or "CHG" to indicate whether we're adding to the file or changing reference information already in it. Columns 4-7 contain the total number of species already referenced in file (at creation this would be 0).

Card 2 — Contains the group number in column 12, species number in columns 13, 14, and 15, followed by the name of the animal in columns 16 through column 80.

Cards 3 through end of reference set (maximum = 60 reference cards). — Contains the index number of the reference in columns 1 and 2, right justified, and reference information in columns 3-76.

Card following reference set — Blank card, necessary to separate this reference set from the following reference set.

Cards for next reference sets — Follows format for cards 2, 3 and a blank for each species referenced.

The reference sets should be entered in order by group number and species index number, (e.g., Group 1 - Species 1 through last species of Group 1 should be entered first followed by the species of groups 2, 3, 4, 5).

Deck Set-up for Creating File

1. Card 1, using the ADD code, then cards 2 and 3 to end of reference set for a species (maximum of 60 cards), blank card, and repeat cards, 2, 3 to end of a species, blank card for all species being entered.

Deck Set-up for Updating File

1. To add one or more reference sets, (i.e., to add references for one or more species which are not currently in the reference file):

Same as described in "Deck Set-up for Creating File", with the code "ADD" in columns 1-3 and the necessary changes on Card 1 to show the number of species which are currently in the reference file. This number can be found on the latest print out from the creation or most recent update of the file — after the last reference set "NNN SPECIES REFERENCED", is printed where NNN is a number.

This will add these reference sets onto the end of the current reference file.

2. To make a correction, change, or addition for one or more species which has been previously referenced in the file:

Card 1 — Will contain the code "CHG" in columns 1-3 and the total number of species referenced in the file in columns 4-7.

Card 2 — Name card of species being updated. (Contains group and species index number)

Card 3 to end of reference set — The complete reference deck with its respective corrections or additions must be present (up to a maximum of 60 cards). Additional references can be added, because the program was written to accommodate all 60 cards (even if only 5 were entered in file creation) reserving blank space for future additions.

Card following reference set — Blank card.

3. To make changes in existing reference sets in the file and add a new species-reference set to the file in the same run:

Always do the CHANGES first and ADD's last. References for several species can be changed by using a single "CHG" card. After the last reference set to be changed, include an extra blank card, followed by a new Card 1 with the code "ADD" and the number of species currently referenced. After the last reference set to be added, include an extra blank card. The program is designed so that an extra blank card after a series of changes signals that a new Card 1 will be read. If no Card 1 appears, it assumes end of file. An extra blank card after ADD's signals end of file only; therefore, all CHANGES must be made before ADD's in the same run.

Disc File Structure

There will be a record 1 and records 2-61 for each animal species for which there exists references. Although there may be just one reference for the animal, the file building program adds blank records through record No. 61 for the species. Future additions replace these blank records. A record with NGRP=999 and NOSP=999 ends the file. It is created by the program.

Disc File Record Structure

Wildlife Reference File

File No. 15

| Record No. | Columns | Variable Name | Variable Description |
|------------|---------|---------------|----------------------------------|
| 1 | 1-3 | NGRP | Animal group number (I3) |
| | 4-6 | NOSP | Animal species number (I3) |
| | 7 | — | Blank |
| | 8-72 | NAME | Animal name (65A1) |
| 2-61 | 1-2 | NR | Species reference number (I2) |
| | 3-76 | NA | Bibliographical reference (74A1) |

PROGRAM TO CREATE THE REFERENCE FILE

```

C --- FOR CHANGES IN EXISTING REFERENCE INFO THE PROGRAM REQUIRES ALL
C --- EXISTING REFERENCES FOR A SPECIES. NOT A 61 CARD SET, BUT ANIMAL
C --- NAME CARD, EXISTING REFERENCES WITH CHANGES. ADDING REFERENCES
C --- FOR AN ANIMAL IS A CHANGE NOT AN ADD.
C --- AN ADD IS ADDITION OF REFERENCES FOR A NEW ANIMAL.
      DIMENSION NA(74),NAME(65)
      DEFINE FILE 15(99999,80,E,I)
C --- NTYPE=ADD OR CHC NREC=NO. OF ANIMALS PRESENTLY REFERENCED.
      1 READ (5,2,END=9999) NTYPE,NREC
      2 FORMAT (A3,I4)
      KK=NREC
C --- NGPP=GROUP NO. NSP=SPECIES NO.
C --- NAME=ANIMAL NAME.
      5 READ (5,10,END=9999) NGRP,NSP,NAME
      10 FORMAT (11X,I1,I3,65A1)
C --- BLANK TRAILER CARD TERMINATES ADD OR CHANGE.
      IF (NGRP.EQ.0) GO TO 1
C --- MREC=TOTAL NO. OF RECORDS NOW IN FILE.
      MREC=NREC*61+1
      IF (NTYPE.EQ.3HADD) GO TO 100

```



```

C --- LOOK FOR SET OF REFERENCES TO BE CHANGED.
DO 20 J=1,MREC,61
  READ (15'I,30) N1,N2
30  FORMAT (2I3)
  IF (N1.EQ.NGRP.AND.N2.EQ.NSP) GO TO 40
C --- LAST RECORD ON DISK IS '999' RECORD.
  IF (N1.EQ.999) GO TO 999
  20  CONTINUE
C --- CHANCE REFERENCE SET.
  40  I=J+1
  45  DO 60 K=1,60
    READ (5,50) NR,NA
  50  FORMAT (I2,74A1)
    IF (NR.NE.0) GO TO 51
    NREF=K-1
    GO TO 61
  51  WRITE (6,300) I,NR,NA
300  FORMAT (1X,16,1X,I2,74A1)
    WRITE (15'I,50) NR,NA
  60  CONTINUE
C --- FILL UNUSED DISK RECORDS IN 60 IMAGE SET WITH BLANKS.
  61  L=60-NREF
  IF (L.EQ.0) GO TO 5
  MM=NREF+1
  DO 70 N=1,74
    NA(N)=1H
  70  CONTINUE
  NR=0
  DO 80 M=MM,60
    WRITE (15'I,50) NR,NA
  80  CONTINUE
C --- MAKE CHANGES IN MORE SETS IF ANY.
  KK=KK+1
  GO TO 5
C --- ADD RECORDS TO END OF FILE.
100  I=MREC
C --- LIST NEW REFERENCES.
  WRITE (6,320) I,NGRP,NSP,NAME
320  FORMAT (1X,316,1X,65A1)
  WRITE (15'I,200) NGRP,NSP,NAME
200  FORMAT (2I3,1X,65A1)
  NREC=NREC+1
  GO TO 45
C --- SPECIES NOT FOUND. BEGIN NEW OPERATION.
999  WRITE (6,110)
110  FORMAT (1X,'SPECIES NOT FOUND.')
  GO TO 5
C --- END FILE WITH A '999' RECORD.
9999 NGRP=999
     NSP=999
     WRITE (6,330) I,NGRP,NSP
330  FORMAT (1X,316)
     WRITE (15'I,30) NGRP,NSP
C --- PRINT NO. OF ANIMALS REFERENCED.
     WRITE (6,340) KK
340  FORMAT (1X,16,' SPECIES REFERENCED.')
     CALL EXIT
     END

```

Appendix E

PROGRAM RUN WILD LISTING

```

C --- PROGRAM RUNWILD OFFERS THE USER THE OPTION TO REQUEST INFORMATION
C --- FROM ITS FILES BY ALLOWING THE USER TO SPECIFY BY CODE THE KIND OF
C --- INFO DESIRED (USER CONTROL) OR HE MAY ALLOW THE PROGRAM TO ASK
C --- QUESTIONS (PROGRAM CONTROL). THE INEXPERIENCED USER MIGHT PREFER
C --- PROGRAM CONTROL.
COMMON/M11/M1
COMMON/NR8/R(8)
COMMON/ESS1/S1
COMMON/NR1/R1
INTEGER R1,R2,R3,R5,R6,R8,R9,R,R11,R12
COMMON/NAN/NRECN(11),NREC1(11),ND11(11),ND22(11),NSW,N2
C --- THE CALLS TO ERTRAN ARE UNIVAC 1100 INSTRUCTIONS TO ASSIGN FILES
C --- WITHIN THE PROGRAM. SUCH INSTRUCTIONS REQUIRE THAT THE FILES BE
C --- AVAILABLE (NOT ARCHIVED OR UNLOADED). WHEN THE FILES ARE NOT
C --- AVAILABLE THE PROGRAM WILL NOT RUN UNTIL FILES ARE ASSIGNED EXTER-
C --- NALLY.
CALL ERTRAN(6,'@ASG,A AMPHIB*AMPH. ')
CALL ERTRAN(6,'@USE 7.,AMPHIB*AMPH. ')
CALL ERTRAN(6,'@ASG,A BIRDS*BRDS. ')
CALL ERTRAN(6,'@USE 8.,BIRDS*BRDS. ')
CALL ERTRAN(6,'@ASG,A FISH*FSH. ')
CALL ERTRAN(6,'@USE 9.,FISH*FSH. ')
CALL ERTRAN(6,'@ASG,A MAMMLS*MAMM. ')
CALL ERTRAN(6,'@USE 10.,MAMMLS*MAMM. ')
CALL ERTRAN(6,'@ASG,A REPTLS*REPT. ')
CALL ERTRAN(6,'@USE 11.,REPTLS*REPT. ')
CALL ERTRAN(6,'@ASG,A VEGTYP*VEGTP. ')
CALL ERTRAN(6,'@USE 12.,VEGTYP*VEGTP. ')
CALL ERTRAN(6,'@USE 13.,KHABFA*HABF. ')
CALL ERTRAN(6,'@ASG,A RNWDMF*RNMF. ')
CALL ERTRAN(6,'@USE 14.,RNWDMF*RNMF. ')
CALL ERTRAN(6,'@ASG,A QRNREF*FRNREF. ')
CALL ERTRAN(6,'@USE 15.,QRNREF*FRNREF. ')
CALL ERTRAN(6,'@ASG,A QCOUNTY*FCOUNTY. ')
CALL ERTRAN(6,'@USE 16.,QCOUNTY*FCOUNTY. ')
CALL ERTRAN(6,'@ASG,A QFOREST*FFOREST. ')
CALL ERTRAN(6,'@USE 17.,QFOREST*FFOREST. ')
C --- DEFINE FILE STATEMENTS AND READS FROM FILES DEFINE BY SUCH STATE-
C --- MENTS MAY BE UNACCEPTABLE TO YOUR SYSTEM. UNIVAC 1100 AND IBM 360
C --- SERIES COMPUTERS WILL ACCEPT THEM.
DEFINE FILE 7(750,80,E,K3)
DEFINE FILE 8(750,80,E,K3)
DEFINE FILE 9(750,80,E,K3)
DEFINE FILE 10(750,80,E,K3)
DEFINE FILE 11(750,80,E,K3)
DEFINE FILE 12(20000,125,E,K3)
DEFINE FILE 13(20000,125,E,K3)
DEFINE FILE 14(99999,80,E,K3)
DEFINE FILE 15(99999,80,E,K3)
DEFINE FILE 16(20000,125,E,K3)
DEFINE FILE 17(20000,125,E,K3)
420 NCNT=0
S1=0.0

```

```

C --- INSTRUCTIONS BETWEEN THIS SET OF COMMENTS AND THE NEXT ALLOW THE
C --- USER TO SPECIFY USER OR PROGRAM CONTROL. M1 =0=PROGRAM CONTROL
C --- M1=1 TO 11=ONE OF 11 LISTS. M1=12=TERMINATE.
    WRITE (6,5)
    5 FORMAT (//,1X,79(1H*),/)
    WRITE (6,9)
    9 FORMAT (1X,'IF YOU WANT CONTROL OVER WHAT LISTS YOU WANT ENTER:',
    1 /,10X,'1 FOR VEG. TYPES',
    2 /,10X,'2 FOR ANIMAL SPECIES IN A GROUP',
    3 /,10X,'3 FOR COUNTIES',
    4 /,10X,'4 FOR FORESTS',
    5 /,10X,'5 FOR KEY HABITAT FACTORS',
    6 /,10X,'6 FOR ANIMALS NEEDING KEY HABITAT FACTORS',
    7 /,10X,'7 FOR ANIMALS IN A VEG. TYPE',
    8 /,10X,'8 FOR MANAGEMENT INFO FOR AN ANIMAL',
    9 /,10X,'9 FOR BIBLIOGRAPHICAL REFERENCES FOR AN ANIMAL',
    A /,9X,'10 FOR ANIMALS IN A COUNTY',
    B /,9X,'11 FOR ANIMALS IN A FOREST',
    C /,9X,'12 TO TERMINATE RUN',
    D /,5X,'ZERO TO BE QUERIED (PROGRAM TAKES CONTROL).')
    6 READ (5,75,END=141) M1
    IF (M1.EQ.0) GO TO 7
C --- USER TAKES CONTROL.
    IF (M1.EQ.12) GO TO 141
    CALL CNTROL (M1)
    WRITE (6,8)
    8 FORMAT (1X,'MORE LISTS UNDER YOUR CONTROL?',/,
    1 1X,'IF SO, ENTER CODE FOR LIST, OTHERWISE ENTER 12 OR ZERO.')
    GO TO 6
C --- PROGRAM TAKES CONTROL.
    7 READ (12'1,10) NREC12,ND1,ND2
    10 FORMAT (I6,2A4,111X)
    WRITE (6,15) ND1,ND2
    15 FORMAT (1X,'IF YOU WANT A LIST OF A SERIES OF VEGETATION TYPES IN
    1THE REGION',/,1X,'ENTER WHOLE NO. PORTION OF HIERARCHY NO.',/,1X,
    2'FOR A COMPLETE LIST ENTER 1. FOR NO LIST ENTER ZERO.',/,1X,
    3'ONLY TYPES WITH ANIMALS IN THEM ARE LISTED WITH INDEX NO.S',/,1X,
    4'LAST UPDATE WAS: ',2A4,/)
C --- INSTRUCTIONS FOLLOWING THIS SET OF COMMENTS ALLOW USER TO REQUEST
C --- A LIST OF VEGETATION TYPES OR SKIP (S1=0) TO LISTING OF COUNTIES.
    18 READ (5,31,END=140) S1
    31 FORMAT ()
    20 FORMAT (A3)
    IF (S1.EQ.0.0) WRITE (6,22)
    22 FORMAT (/,1X,79(1H*),/)
    IF (S1.GT.0.0) CALL LISTVT (NREC12,12)
    IF (S1.EQ.0.0.OR.S1.EQ.1.0) GO TO 19
    WRITE (6,14)
    14 FORMAT (1X,'IF YOU WANT MORE, ENTER ANOTHER HIE RARCHY NO., OTHERWI
    1SE ENTER ZERO..',/)
    GO TO 18
C --- LIST COUNTIES OR SKIP (R1=NO) TO LISTING OF FORESTS.
    19 READ (16'1,10) NREC16,ND1,ND2
    WRITE (6,16) ND1,ND2
    16 FORMAT (1X,'IF YOU WANT A LIST OF COUNTIES IN THE REGION ENTER YES
    1.',/,1X,'IF NOT ENTER NO.',/,1X,'LAST UPDATE WAS: ',2A4,/)
    READ (5,20,END=140) R1
    IF (R1.NE.3HYES) WRITE (6,22)
    IF (R1.EQ.3HYES) CALL LISTVT (NREC16,16)

```

```

C --- LIST FORESTS OR SKIP (R1=NO) TO LISTING OF ANIMAL GROUPS.
  READ (17'1,10) NREC17,ND1,ND2
  WRITE (6,17) ND1,ND2
17 FORMAT (1X,'IF YOU WANT A LIST OF FORESTS IN THE REGION ENTER YES.
1' ,/,1X,'IF NOT ENTER NO.' ,/,1X,'LAST UPDATE WAS: ',2A4,/)
  READ (5,20,END=140) R1
  IF (R1.NE.3HYES) WRITE (6,22)
  IF (R1.EQ.3HYES) CALL LISTVT (NREC17,17)
C --- LIST SELECTED ANIMAL GROUP OR SKIP (R2=0) TO LISTING OF KEY HABI-
C --- TAT FACTORS.
  DO 25 N=7,11
  READ (N'1,21) NRECN(N),ND11(N),ND22(N)
21 FORMAT (I5,2A4,67X)
  NCNT=NCNT+NRECN(N)
25 CONTINUE
30 WRITE (6,35) (ND11(J),ND22(J),J=7,11)
35 FORMAT(1H0,'IF YOU WANT A LIST OF THE FOLLOWING ANIMALS FOR THE RE
1GION:',/,10X,'1. AMPHIBIANS LAST UPDATE WAS: ',2A4,/,10X,'2. BI
2RDS LAST UPDATE WAS: ',2A4,/,10X,'3. FISH LAST UPDA
3TE WAS: ',2A4,/,10X,'4. MAMMALS LAST UPDATE WAS: ',2A4,/,10X,
4'5. REPTILES LAST UPDATE WAS: ',2A4,/,1X,'ENTER THE GROUP NO.,
5 IF YOU DO NOT WANT A LIST ENTER ZERO.' ,/)
40 READ (5,45,END=140) R2
45 FORMAT (I1)
  IF (R2.LE.0) GO TO 60
  IF (R2.LE.6) GO TO 55
  WRITE (6,50)
50 FORMAT (1X,'TRY AGAIN. NUMBER MUST BE GREATER THAN ZERO AND LESS
1THAN 6.' ,/)
  GO TO 40
55 R3=R2+6
  N=NRECN(R3)
  CALL LSTSIG(N,R3)
  WRITE (6,180)
180 FORMAT (1X,'DO YOU WANT A LIST OF ANOTHER GROUP (YES OR NO)?',/,
1 1X,'IF YES ENTER GROUP NO.' ,/)
  READ (5,20,END=140) NR1
  IF (NR1.EQ.3HYES) GO TO 40
  WRITE (6,22)
  60 IF (R2.LE.0) WRITE (6,22)
C --- LIST KEY HABITAT FACTORS OR SKIP (R8=NO) TO LISTING OF ANIMALS
C --- NEEDING A KEY HABITAT FACTOR.
  READ (13'1,10) NREC13,ND1,ND2
  WRITE (6,65) ND1,ND2
65 FORMAT (1X,'IF YOU WANT KEY HABITAT FACTORS NEEDED BY MANY SPECIES
1 IN THE REGION LISTED',/,1X,'ENTER YES, IF NOT ENTER NO. LAST UPD
2ATE WAS: ',2A4,/)
  READ (5,20,END=140) R8
  IF (R8.NE.3HYES) WRITE (6,22)
  IF (R8.EQ.3HYES) CALL LISTVT(NREC13,13)
C --- LIST ANIMALS NEEDING A KEY HABITAT FACTOR OR SKIP (R9,R1=0) TO
C --- LISTING OF ANIMALS IN A SERIES OF VEG. TYPES.
74 WRITE (6,70)
70 FORMAT (1X,'IF YOU WANT A LIST OF SPECIES IN A GROUP NEEDING A HAB
1ITAT FACTOR',/,1X,'ENTER THE FACTOR INDEX NO. AND THE GROUP NO.' ,/,
21X,'FOR A LIST OF ALL GROUPS NEEDING A FACTOR ENTER FACTOR NO. AND
3 ZERO.' ,/,1X,'FOR NO LIST ENTER ZEROS.' ,/)
  READ (5,75,END=140) R9,R1

```



```

75 FORMAT ( )
   IF (R9.LE.0) GO TO 76
   IF (R9.LE.NREC13) GO TO 77
   WRITE (6,78)
78 FORMAT (//,1X,'THE INDEX NO. YOU ENTERED WAS TOO LARGE.',/)
   GO TO 74
77 IF (R9.GT.0) CALL LSTSIV(R9,13)
   GO TO 74
76 WRITE (6,22)
79 NSW=0
C --- LIST ANIMALS IN A SERIES OF VEG. TYPES OR SKIP (N1=0) TO LISTING
C --- OF ANIMALS IN A SERIES OF COUNTIES.
   WRITE (6,80)
80 FORMAT (1X,'IF YOU WANT A LIST OF SPECIES IN A GROUP IN A SERIES O
1F VEGETATION TYPES.',/,1X,'ENTER INDEX NO. OF FIRST TYPE, THAT OF
2LAST, AND GROUP NO.',/,1X,'FOR A LIST OF ALL GROUPS IN THESE TYPES
3 LET GROUP NO. BE ZERO.',/,1X,'FOR NO LIST ENTER ZEROS. IF ONE TYP
4E ENTER VEG. TYPE INDEX NO. TWICE & GROUP NO.',/)
   READ (5,90,END=140) N1,N2,R1
90 FORMAT ( )
   IF (N1.LE.0) WRITE (6,22)
   IF (N2.LE.NREC12) GO TO 91
   WRITE (6,92)
92 FORMAT (//,1X,'UPPER INDEX TOO LARGE.',/)
   GO TO 79
91 IF (N1.LE.0) GO TO 100
   DO 95 J=N1,N2
   CALL LSTSIV(J,12)
95 CONTINUE
   GO TO 79
100 NSW=0
C --- LIST ANIMALS IN A SERIES OF COUNTIES OR SKIP (N1=0) TO LISTING OF
C --- ANIMALS IN A SERIES OF FORESTS.
   WRITE (6,81)
81 FORMAT (1X,'IF YOU WANT A LIST OF SPECIES IN A GROUP IN A SERIES O
1F COUNTIES.',/,1X,'ENTER INDEX NO. OF FIRST COUNTY, THAT OF LAST &
2 GROUP NO.',/,1X,'FOR A LIST OF ALL GROUPS IN THESE COUNTIES LET G
3ROUP NO. BE ZERO.',/,1X,'FOR NO LIST ENTER ZEROS. IF ONE COUNTY EN
4TER COUNTY INDEX NO. TWICE & GROUP NO.',/)
   READ (5,90,END=140) N1,N2,R1
   IF (N1.LE.0) WRITE (6,22)
   IF (N2.LE.NREC16) GO TO 82
   WRITE (6,83)
83 FORMAT (//,1X,'UPPER INDEX TOO LARGE',/)
   GO TO 100
82 IF (N1.LE.0) GO TO 300
   DO 85 J=N1,N2
   CALL LSTSIV(J,16)
85 CONTINUE
   GO TO 100
300 NSW=0
C --- LIST ANIMALS IN A SERIES OF FORESTS OR SKIP (N1=0) TO LISTING OF
C --- MANAGEMENT INFO ON AN ANIMAL.
   WRITE (6,381)
381 FORMAT (1X,'IF YOU WANT A LIST OF SPECIES IN A GROUP IN A SERIES O
1F FORESTS.',/,1X,'ENTER INDEX NO. OF FIRST FOREST, THAT OF LAST, &
2 GROUP NO.',/,1X,'FOR A LIST OF ALL GROUPS IN THESE FORESTS LET GR
3OUP NO. BE ZERO.',/,1X,'FOR NO LIST ENTER ZEROS. IF SAME FOREST EN
4TER FOREST INDEX NO. TWICE & GROUP NO.',/)

```

```

      READ (5,90,END=140) N1,N2,R1
      IF (N1.LE.0) WRITE (6,22)
      IF (N2.LE.NREC17) GO TO 382
      WRITE (6,83)
      GO TO 300
382  IF (N1.LE.0) GO TO 101
      DO 385 J=N1,N2
      CALL LSTSIV(J,17)
385  CONTINUE
      GO TO 300
C --- LIST MANAGEMENT INFO FOR AN ANIMAL OR SKIP (R5=0) TO LISTING OF
C --- REFERENCES FOR AN ANIMAL.
101  WRITE (6,105)
105  FORMAT (1H , 'IF YOU WANT MANAGEMENT INFO. ON A SPECIES, ENTER GROU
      IP NO. AND SPECIES NO.',/,1X, 'IF NOT ENTER ZEROS',/,)
      READ (5,110,END=140) R5,R6
110  FORMAT ( )
      IF (NDR(R5,R6).NE.0) GO TO 500
      WRITE (6,510) R5,R6
510  FORMAT (1X, 'THERE IS NO MANAGEMENT INFO FOR GROUP ',I3, ' SPECIES'
      1 ,I4)
      WRITE (6,22)
      GO TO 125
500  IF (R5.LE.0) WRITE (6,22)
      IF (R5.LE.0) GO TO 125
      IF (R5.LE.5.AND.R5.GE.1) GO TO 111
      WRITE (6,112)
112  FORMAT (/,1X, 'GROUP NO. MUST BE 1 TO 5.',/)
      GO TO 101
111  IF (R5.LE.0) GO TO 125
      WRITE (6,115)
115  FORMAT (1X, 'ENTER NO. OF CODES AND CODE NO.S FROM FOLLOWING LIST F
      IOR INFO. NEEDED.',/,
      2      8X, 'CODES',/,10X, '0 = NONE',/,10X, '1 = GENERAL DISTRIBUTION',/
      3      ,10X, '2 = PROTECTION STATUS',/,10X, '3 = VEGETATION TYPES',/,
      4      10X, '4 = FOOD HABITS',/,10X, '5 = COVER REQUIREMENTS',/,
      5      10X, '6 = KEY HABITAT FACTORS',/,10X, '7 = MANAGEMENT PRACTICES',
      6      /,10X, '8 = ALL',/)
      116 READ (5,120,END=140) N,(R(I),I=1,N)
120  FORMAT ( )
      IF (N.LE.0) GO TO 125
      IF (N.LE.7) GO TO 121
      WRITE (6,122)
122  FORMAT (/,1X, 'NO. OF CODES MUST BE ZERO TO 7. TRY AGAIN.',/)
      GO TO 116
121  CALL MNGING(N,R5,R6,NCNT)
C --- LIST REFERENCES FOR AN ANIMAL OR SKIP(R11=0) TO LISTING OF
C --- MANAGEMENT INFO AND/OR REFERENCES FOR ANOTHER ANIMAL.
125  WRITE (6,150)
150  FORMAT (1X, 'IF YOU WANT TO LIST SELECTED REFERENCES FOR AN ANIMAL
      1SPECIES',/,1X, 'ENTER THE GROUP NO. AND SPECIES NO., OTHERWISE ENTER
      2 ZEROS.',/)
170  READ (5,120,END=140) R11,R12
      IF (R11.EQ.0) GO TO 160
      CALL MNREF (R11,R12,NCNT)
      WRITE (6,155)
155  FORMAT (1X, 'MORE REFERENCES, OTHER SPECIES?',/,1X, 'IF YES ENTER GRO
      1UP NO. AND SPECIES NO., OTHERWISE ZEROS.',/)
      GO TO 170

```



```

160 WRITE (6,22)
    WRITE (6,130)
130 FORMAT (1X,'DO YOU WANT MANAGEMENT INFO ON ANOTHER SPECIES?',/,
1      1X,'IF YES ENTER GROUP NO., SPECIES NO.'CR & NO. OF CODES
2 AND CODES.',/,1X,'IF NO ENTER ZEROS.',/)
    READ (5,110,END=140) R5,R6
    IF (R5.LE.0) GO TO 106
    GO TO 116
106 WRITE (6,22)
C --- GO BACK TO ASK FOR LIST OF ANOTHER ANIMAL GROUP. REPEAT OPTIONS
C --- FOLLOWING THAT.
    WRITE (6,200)
200 FORMAT (1X,'DO YOU WANT TO LIST ANOTHER GROUP?',/,1X,'IF YES ENTER
1 GROUP NO., OTHERWISE ZERO.',/)
    READ (5,45,END=140) R2
    IF (R2.GT.0) GO TO 55
C --- IF AN @EOF WAS KEYED FOR ANY RESPONSE YOU ARE SENT HERE AND AGAIN
C --- ALLOWED TO SELECT USER OR PROGRAM CONTROL.
140 WRITE (6,142)
142 FORMAT (1H0,'IF YOU WANT CONTROL USE CODES 1-11 AS DEFINED AT STAR
1T OF RUN.',/,1X,'TO EXIT ENTER 12.')
```

GO TO 6

```

141 WRITE (6,210)
210 FORMAT (/,1X,35H'THAT'S ALL Y'ALL. ENTER @FIN, KIN. ',/)
    WRITE (6,22)
    CALL EXIT
    END

    SUBROUTINE LISTVT(NOREC,NLST)
C --- SUBROUTINE THAT LISTS VEGETATION TYPES,KEY HABITAT FACTORS, COUNTIES
C --- OR FORESTS.
    DIMENSION NSC(6),NCM(6)
    COMMON/ESS1/S1
C --- FILES 12,13,16,17 = VEG. TYPES, KEY HABITAT FACTORS, COUNTIES,
C --- FORESTS, RESPECTIVELY.
    IF (NLST.EQ.12) WRITE (6,1)
1  FORMAT (1X,'INDEX',/,2X,'NO. ID NO. NAME',/)
    IF (NLST.EQ.13) WRITE (6,2)
    IF (NLST.EQ.16) WRITE (6,2)
    IF (NLST.EQ.17) WRITE (6,2)
2  FORMAT (/,5X,'INDEX',/,6X,'NO. NAME',/)
    KK=-1
    J=NOREC-30
    DO 40 L=2,J,31
    K=L
C --- READ A DISK RECORD CONTAINING HIERARCHY OR ID NO., INDEX NO. OF
C --- THIS RECORD, NO. OF ANIMALS ASSOCIATED WITH THIS RECORD, AND NAME
C --- OF VEG. TYPE, KEY HAB. FAC., COUNTY OR FOREST.
    READ (NLST*K,20) ANUM,II,N3,NSC,NCM
20  FORMAT (F8.4,I5,I4,12A6,36X)
    KK=KK+1
C --- IF NO. OF ANIMALS GT ZERO PRINT NAME READ ABOVE.
    IF (N3.GT.0) GO TO 16
    IF (NLST.EQ.13) GO TO 15
    IF (NLST.EQ.16) GO TO 15
    IF (NLST.EQ.17) GO TO 15
C --- LIST THE VEG. TYPE NAME AT BIOME LEVEL EVEN IF NO ANIMALS DWELL
```

```

C --- WITHIN.
      N=ANUM*10000.0
      IF (MOD(N,1000).NE.0) GO TO 15
      NSW1=0
C --- IF S1=1 (SET IN MAIN PROGRAM) COMPLETE LIST OF VEG. TYPES IS GIVEN
C --- OTHERWISE ONLY A SELECTED PORTION OF LIST.
      IF (S1.EQ.1.0) NSW=1
      IF ((ANUM-S1).GE.0.0.AND.(ANUM-S1).LT.10.0) NSW1=1
      IF (NSW1.EQ.0) GO TO 40
      WRITE (6,50) ANUM,NSC,NCM
50  FORMAT (6X,F9.3,3X,12A6)
15  IF (N3.LE.0) GO TO 40
16  JJ=II-30*KK-1
      IF (NLST.NE.12) GO TO 32
      NSW=0
      IF (S1.EQ.1.0) NSW=1
      IF ((ANUM-S1).GE.0.0.AND.(ANUM-S1).LT.10.0) NSW=1
      IF (NSW.EQ.0) GO TO 40
      WRITE (6,30) JJ,ANUM,NSC,NCM
      GO TO 40
30  FORMAT (1X,I4,1X,F9.3,3X,12A6)
32  IF (NLST.EQ.13) WRITE (6,31) JJ,NSC,NCM
      IF (NLST.EQ.16) WRITE (6,31) JJ,NSC,NCM
      IF (NLST.EQ.17) WRITE (6,31) JJ,NSC,NCM
31  FORMAT (4X,I5,2X,12A6)
40  CONTINUE
      WRITE (6,35)
35  FORMAT (/,1X,79(1H*),/)
      RETURN
      END

      SUBROUTINE LSTSIG(NSIG,NF)
C --- SUBROUTINE THAT LISTS AMPHIBIANS, BIRDS, FISH, MAMMALS, OR REPTILES
      DIMENSION NSC(36),NCM(36),NNAME(2,5)
      DATA ((NNAME(I,J),I=1,2),J=1,5)/5HAMPHI,5HBIANS,5HBIRDS,5H      ,5H
1  FISH,5H      ,5HMAMMA,5HLS      ,5HREPTI,5HLES /
C --- CHANGE NF (SELECTED GROUP FILE NO.) TO 1,2,3,4, OR 5 (GROUP NO.).
      MM=NF-6
      WRITE (6,5) (NNAME(I,MM),I=1,2),MM
      5  FORMAT (/,1X,'LISTED BELOW IS THE GROUP CALLED: ',2A5,'. IT IS GR
1  OUP NO. ',I1,'.',/,5X,'INDEX',/,6X,'NO.',10X,'NAME')
C --- NSIG = NO. OF ANIMALS IN FILE.
      NSIG=NSIG+1
      NX1=1H
      DO 10 K=2,NSIG
      I=K
      READ (NF,I,15) NOSPC,NSC,NCM
15  FORMAT (1X,I4,72A1,3X)
      IF (NSC(1).EQ.NX1) GO TO 35
C --- SPACE BETWEEN GROUPS OF ANIMALS WITH DIFFERENT FIRST LETTER OF
C --- NAME.
      NX1=NSC(1)
      WRITE (6,25)
25  FORMAT (1X)
35  WRITE (6,20) NOSPC,NSC,NCM
20  FORMAT (5X,I4,2X,72A1)
10  CONTINUE
      WRITE (6,40)

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40 FORMAT (/ ,10X, '+ INDICATES CONTINUATION OF A ONE WORD NAME',
1 / ,10X, '* INDICATES A THREATENED AND/OR ENDANGERED SPECIES')
WRITE (6,30)
30 FORMAT (/ ,1X,79(1H*),/)
RETURN
END

```

```

SUBROUTINE LSTSIV (INDX,NF)
C --- SUBROUTINE THAT LISTS ANIMALS IN VEGETATION TYPE, COUNTY, OR FOREST,
C --- OR ANIMALS NEEDING A PARTICULAR KEY HABITAT FACTOR
COMMON/NAN/NRECN (11),NREC1(11),ND11(11),ND22(11),NSW,N2
COMMON/M11/M1
COMMON/NR1/R1
INTEGER R1
DIMENSION NSC(6),NCM(6),NFILL(6),NGR(750),NSP(750)
DATA NFILL/5HFOLLO,5HWING,5HIS A,5HLIST,5HOF AN,5HIMALS/
C --- LIST OF VARIABLES USED IN LSTSIV AND THEIR USES
C --- INDX : INDEX NO. OF VEG. TYPE, KEY HAB. FAC., COUNTY, OR FOREST
C --- (HENCEFORTH TO BE CALLED ELEMENT).
C --- KK : NO. OF ELEMENTS PRECEDING THIS ONE ON DISK.
C --- I : DISK RECORD NO. OF NAME RECORD OF ELEMENT.
C --- NF : FILE NO. (12,13,16,OR17) OF ELEMENT.
C --- ANUM : HIERARCHY OR ID NO. OF ELEMENT.
C --- N3 : NO. OF ANIMALS ASSOCIATED WITH ELEMENT.
C --- NSC,NCM : SCIENTIFIC & COMMON NAMES OF ELEMENT.
C --- M1 : VARIABLE COMMONED WITH MAIN PROGRAM AND CONTROL SUBROUTINE TO
C --- IDENTIFY WHICH ANIMAL GROUP IS BEING REQUESTED WHEN IN USER
C --- CONTROL.
C --- NSW : A SWITCH SET TO 1 WHEN A SERIES OF ELEMENTS FOR WHICH ASSOC-
C --- IATIONS ARE REQUESTED HAVE NONE TO LIMIT PRINTING. LEFT AT ZERO
C --- WHEN THERE ARE ASSOCIATIONS.
C --- N15,N16 : FIRST & LAST INDEX NO.'S OF A SERIES OF ANIMALS NOT
C --- ASSOCIATED WITH AN ELEMENT.
C --- N2 : VARIABLE COMMONED WITH MAIN PROGRAM. INDEX NO. OF LAST OF A
C --- SERIES OF ELEMENTS FOR WHICH ASSOCIATIONS ARE REQUESTED.
C --- NFILL : FIRST PART OF PRINT LINE USED WITH ALL ELEMENTS.
C --- M : RECORD NO. OF FIRST ASSOCIATIONS RECORD FOR AN ELEMENT.
KK=INDX-1
C --- DETERMINE DISK RECORD NO. OF NAME RECORD.
I=31*KK+2
C --- READ NAME RECORD FROM DISK FOR VEG. TYPE, KEY HAB. FAC., COUNTY OR
C --- FOREST SELECTED.
READ (NF,I,10) ANUM,N3,NSC,NCM
10 FORMAT (F8.4,5X,I4,12A6,36X)
C --- ONLY READ IN AND PRINT ASSOCIATIONS WITH THE ELEMENT IF THERE ARE
C --- ANY.
IF (N3.GT.0) GO TO 15
IF (N3.GT.0.AND.M1.GT.0) GO TO 55
C --- ONLY DO NEXT 11 LINES IF NO ASSOCIATIONS.
IF (NSW.EQ.0) N15=INDX
NSW=1
N16=INDX
IF (INDX.EQ.N2) GO TO 15
RETURN
15 IF (NSW.EQ.0) GO TO 55
WRITE (6,25) NF,N15,N16

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25 FORMAT (1H0,'NO SPECIES OCCUR IN FILE NO. ',I2,' FOR INDEX NO.S ',
1 I3,' THRU ',I3,' IN THAT FILE.',/)
WRITE (6,75)
IF (INDX.EQ.N2.AND.N3.EQ.0) RETURN
C --- WRITE HEADINGS.
55 IF (NF.EQ.12) WRITE (6,20) NFILL,NSC,NCM,ANUM,INDX
20 FORMAT (/ ,1X,6A5,' IN VEGETATION TYPE: ',
1 //,20X,12A6,/,13X,' ID NO. : ',F9.4,5X,' INDEX NO. : ',I5,/)
IF (NF.EQ.13) WRITE (6,30) NFILL,NSC,NCM,INDX
30 FORMAT (/ ,1X,6A5,' NEEDING HABITAT FACTOR: ',//,20X,12A6,/,
1 25X,' INDEX NO. - ',I5,/)
IF (NF.EQ.16) WRITE (6,31) NFILL,NSC,NCM,INDX
31 FORMAT (/ ,1X,6A5,' IN COUNTY: ',//,20X,12A6,/,
1 25X,' INDEX NO. - ',I5,/)
IF (NF.EQ.17) WRITE (6,32) NFILL,NSC,NCM,INDX
32 FORMAT (/ ,1X,6A5,' IN FOREST: ',//,20X,12A6,/,
1 25X,' INDEX NO. - ',I5,/)
WRITE (6,35)
35 FORMAT (1X,'GROUP SPECIES',/,2X,'NO. NO.',10X,'NAME',/)
C --- READ GROUP SPECIES NO.'S OF ANIMALS ASSOCIATED WITH ELEMENT.
M=31*KK+3
READ (NF'M,40) (NGR(J),NSP(J),J=1,750)
40 FORMAT (25(I1,I4))
C --- READ AND WRITE NAMES OF ANIMALS ASSOCIATED WITH ELEMENT FROM FILE
C --- 7, 8, 9, 10, OR 11.
DO 70 I=1,N3
JJ=NGR(I)
LL=NSP(I)
IF (NGR(I).GT.5) GO TO 70
IF (R1.EQ.0) GO TO 71
IF (NGR(I).NE.R1) GO TO 70
71 N=NGR(I)+6
KK=NSP(I)+1
IF (NGR(I).EQ.2.AND.NSP(I).GE.178) KK=KK-1
READ (N'KK,50) NOGRP,NOSPC,NSC,NCM
IF (NOGRP.GT.5) GO TO 70
WRITE (6,60) NOGRP,NOSPC,NSC,NCM
60 FORMAT (4X,I1,4X,I4,4X,12A6)
50 FORMAT (I1,I4,12A6,15X)
70 CONTINUE
NSW=0
WRITE (6,75)
75 FORMAT (/ ,1X,79(1H*),/)
RETURN
END

SUBROUTINE MNGING(NCDS,NGRP,NSPC,NCNT)
C --- SUBROUTINE THAT LISTS MANAGEMENT INFORMATION FOR A GIVEN ANIMAL
COMMON/NR8/R(8)
DIMENSION NSC(6),NCM(6),NA(80)
INTEGER R
COMMON/NAN/NRECN(11),NRECl(11),ND11(11),ND22(11),NSW,N2
DIMENSION Z(11,2)
EQUIVALENCE (Z,NRECN)
C --- LIST OF VARIABLES USED IN MNGING AND THEIR USES
C --- Z(11,2) : (Z(7,I) THROUGH Z(11,I),I=1,2) CONTAIN NO. OF ANIMALS IN
C --- THE GROUP FILES. THEY'RE OBTAINED FROM NRECN(11) OR NRECl(11)
C --- DEFINED IN MAIN PROGRAM OR CONTROL SUBROUTINE.

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C --- INDX : CAUSES Z ARRAY TO BE DEFINED DEPENDING ON NRECN OR NREC1
C --- ARRAY (PROGRAM OR USER CONTROL).
C --- NRECN(11) : NO.'S OF ANIMALS IN EACH GROUP (READ BY MAIN PROGRAM)
C --- ONLY ELEMENTS 7-11 ARE USED.
C --- NREC1(11) : SAME AS NRECN(11) BUT READ BY CONTROL SUBROUTINE.
C --- NCDS : NO. OF CATEGORIES OF MNGMNT INFO REQUESTED FOR ANIMAL.
C --- R(8) : INPUT ARRAY CONTAINING CODES FOR CATEGORIES 1-8 (8=ALL).
C --- NGRP : GROUP NO.
C --- NSPC : SPECIES NO.
C --- I : RECORD NO. OF ANIMAL NAME RECORD IN MNGMNT FILE.
C --- NA(80) : READ AND PRINT LINE.
C --- N2,N3 : FIRST AND LAST RECORD NO.'S OF A MNGMNT INFO CATEGORY TO
C --- BE PRINTED FOR AN ANIMAL.
C --- M7=NO. OF ANIMAL IN FILE ASSUMING ANIMALS TO BE IN SEQUENCE WITH
C --- GROUP 1 FIRST, GROUP 2 SECOND, 3, THIRD, ETC.
      IF (NRECN(7).GT.0) INDX1=1
      IF (NREC1(7).GT.0) INDX1=2
      M7=0
      DO 200 K=1,5
      IF (K.NE.NGRP) GO TO 205
      KK=K+6
      M7=M7+Z(KK,INDX1)
      GO TO 200
205  (IF K.GT.NGRP) GO TO 210
      M7=NSPC+M7
200  CONTINUE
210  I=M7*60+1
      IF (NGRP.GT.5) GO TO 90
C --- READ FIRST RECORD FOR ANIMAL FROM MNGMNT FILE.  IT CONTAINS GROUP
C --- NO., SPECIES NO., AND NAME.
      READ (14'I,20) NG1,NS1,NSC,NCM
20  FORMAT (I1,I5,12A6,2X)
      IF (NG1.GT.5) GO TO 90
      IF (NG1.NE.NGRP.AND.NS1.NE.NSPC) GO TO 90
      N1=I
      WRITE (6,35) NG1,NS1,NSC,NCM
35  FORMAT (/ ,1X, 'FOLLOWING IS MANAGEMENT INFO. FOR GROUP ',I1,
1    ' ', SPECIES ',I4, / ,1X, 'SPECIES NAME: ',12A6/)
      DO 50 J=1,NCDS
      IF (R(J).LE.0) GO TO 50
      IF (R(J).GT.8) GO TO 50
      JR=R(J)
      GO TO (1,2,3,4,5,6,7,8),JR
1  N2=N1+1
   N3=N1+7
   GO TO 60
2  N2=N1+8
   N3=N1+11
   GO TO 60
3  N2=N1+12
   N3=N1+17
   GO TO 60
4  N2=N1+18
   N3=N1+24
   GO TO 60
5  N2=N1+25
   N3=N1+33
   GO TO 60

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6 N2=N1+34
  N3=N1+38
  GO TO 60
7 N2=N1+39
  N3=N1+59
  GO TO 60
8 N2=N1+1
  N3=N1+59
60 DO 80 I=N2,N3
   K=I
C --- READ AND WRITE MNGMNT INFO FOR THE ANIMAL FOR A CATEGORY.
   READ (14,K,65) NA
65 FORMAT (80A1)
   DO 75 INDX=1,80
   IF (NA(INDX).NE.1H ) GO TO 78
75 CONTINUE
78 WRITE (6,70) NA
70 FORMAT (1X,80A1)
80 CONTINUE
   WRITE (6,85)
85 FORMAT (/ ,1X,79(1H*) ,/)
50 CONTINUE
   GO TO 100
90 WRITE (6,95) NGRP,NSPC
95 FORMAT (1X, 'THERE IS NO MANAGEMENT INFORMATION ON GROUP ',I1,' SPECIES ',I4,' IN FILE.',/)
   WRITE (6,85)
100 RETURN
   END

SUBROUTINE MNREF (R11,R12,NCNT)
C --- SUBROUTINE THAT LISTS BIBLIOGRAPHICAL REFERENCES FOR A GIVEN ANIMAL
DIMENSION R(30),NA(74),NAME(72)
INTEGER R,R11,R12
COMMON/NAN/NRECN(11),NREC1(11),ND11(11),ND22(11),NSW,N2
DIMENSION Z(11,2)
EQUIVALENCE (Z,NRECN)
C --- LIST OF VARIABLES USED IN MNREF AND THEIR USES
C --- Z(11,2) : SAME AS IN MNGING.
C --- INDX : SAME AS IN MNGING.
C --- NRECN(11) : SAME AS IN MNGING.
C --- NREC1(11) : SAME AS IN MNGING.
C --- R11 : GROUP NO.
C --- R12 : SPECIES NO.
C --- I : RECORD NO. NAME RECORD FOR ANIMAL REQUESTED.
C --- N : KEYBOARD INPUT. N=0=NO REFERENCES REQUESTED. N=99=A SERIES
C --- IN SEQUENCE. N=NOT ZERO OR 99=LIST REFERENCE NO.'S X,Y,Z,ETC.,
C --- WHERE X,Y,Z,ETC. WILL BE KEYED IN.
C --- R(8) : INDEX NO.'S OF SELECTED REFERENCES (TO BE KEYED IN).
C --- I1,I2 : LIMITS OF NO. OF REFERENCE RECORDS THAT NEED TO BE CHECKED
C --- FOR PRINTING.
C --- M,NN : FIRST AND LAST INDEX NO.'S OF REFERENCES TO BE LISTED.
C --- NSW : SWITCH SET TO 1 WHEN A DESIRED REFERENCE IS FOUND AND
C --- PRINTED. IT ALLOWS FOR REFERENCES NOT IN SEQUENCE.
C --- L : RECORD NO. OF A REFERENCE FOR AN ANIMAL TO BE READ AND CHECKED
C --- FOR PRINTING.
C --- NR : REFERENCE NO. AS READ FROM DISK.
C --- NA(80) : READ AND PRINT LINE (REFERENCE INFO).

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C --- KK : SAVED AS RECORD NO. OF LAST READ RECORD TO SEE IF LATER READ
C --- REFERENCE RECORDS ARE PART OF THE DESIRED REFERENCE.
C --- M7=NO. OF ANIMAL IN FILE ASSUMING ANIMALS TO BE IN SEQUENCE WITH
C --- GROUP 1 FIRST, GROUP 2 SECOND, 3, THIRD, ETC.
      IF (R11.GT.5) GO TO 100
      IF (NRECN(7).GT.0) INDX1=1
      IF (NRECN(7).GT.0) INDX1=2
      M7=0
      DO 200 K=1,5
      IF (K.NE.R11) GO TO 205
      LL=K+6
      M7=M7+Z(LL,INDX1)
      GO TO 200
205 IF (K.GT.R11) GO TO 210
      M7=R12+M7
200 CONTINUE
210 I=M7*60+1
C --- READ RECORD FROM REFERENCE FILE WITH GROUP NO. SPECIES NO. AND
C --- NAME.
      READ (15,I,20) NGRP,NSP,NAME
20  FORMAT (2I3,1X,72A1)
      IF (NGRP.GT.5) GO TO 100
      IF (NGRP.NE.R11.AND.NSP.NE.R12) GO TO 100
      WRITE (6,10)
10  FORMAT (/,1X,'IF YOU WANT A SERIES OF REFERENCES NOT IN SEQUENCE',
A/,1X,'ENTER NO. OF REFERENCES CR & THEIR INDECEs.',/,1X,'FOR A SERI
BES IN SEQUENCE ENTER THE NO. 99 CR & FIRST AND LAST INDEX NO.s.',
C  /,1X,'IF NONE ENTER ZEROES.',/)
      NREC=I
35  READ (5,40) N
40  FORMAT ( )
      IF (N.EQ.0) GO TO 9999
      IF (N.EQ.99) READ (5,40) R(1),R(2)
      IF (N.NE.99) READ (5,40) (R(J),J=1,N)
      WRITE (6,47) NAME,NGRP,NSP
47  FORMAT (/,1X,'FOLLOWING IS A LIST OF REFERENCES FOR THE ANIMAL CAL
1LED ',/,10X,72A1,/,20X,'GROUP NO. - ',I3,2X,'SPECIES NO. - ',I3,/)
      I1=1
      I2=60
      IF (N.EQ.99) GO TO 90
      M=1
      NN=N
C --- LOOP 70 INTRODUCES THE DESIRED REFERENCE TO LOOP 60.
45  DO 70 I=M,NN
42  NSW=0
C --- LOOP 60 CHECKS EACH OF THE 60 REFERENCE RECORDS TO SEE IF IT'S A
C --- DESIRED ONE.
      DO 60 J=I1,I2
      L=NREC+J
      READ (15,L,50) NR,NA
50  FORMAT (I2,74A1)
      KK=J
      IF (NR.EQ.0) GO TO 71
      IF (N.EQ.99.AND.(NR.GE.M.AND.NR.LE.NN)) GO TO 53
      IF (N.EQ.99) GO TO 65
      IF (NR.NE.R(I)) GO TO 65
53  WRITE (6,55) NR,NA
55  FORMAT (1X,I2,74A1)
      NSW=1

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60 CONTINUE
C --- CHECK FURTHER IN 60 RECORD SET FOR MATCHES IN CASE OF POSSIBLE
C --- NON-SEQUENCED SET.
65 I1=KK
   IF (NSW.NE.0) GO TO 70
   I1=I1+1
   GO TO 42
70 CONTINUE
71 WRITE (6,75)
75 FORMAT (/,1X,'MORE FOR SAME SPECIES?',/,1X,'IF YES ENTER MORE INDE
  LCES AS BEFORE, OTHERWISE ENTER ZERO.',/)
   GO TO 35
90 M=R(1)
   NN=R(2)
   GO TO 45
100 WRITE (6,110) R11,R12
110 FORMAT (/,1X,'THERE ARE NO REFERENCES FOR GROUP ',I2,' SPECIES ',
  1 I3)
9999 WRITE (6,85)
85 FORMAT (/,1X,75(1H*))
   RETURN
   END

SUBROUTINE CNTROL(M1)
C --- SUBROUTINE THAT ALLOWS THE USER TO SELECT WHAT TYPE OF INFORMATION HE
C --- WANTS (WITHIN THE LIMITATIONS OF THE PROGRAM)
COMMON/NDIR/NDR(5,750)
COMMON/NAN/NRECN(11),NREC1(11),ND11(11),ND22(11),NSW,N2
COMMON/NR8/R(8)
COMMON/ESS1/S1
COMMON/NR1/R1
INTEGER R1
INTEGER R
C --- LIST OF VARIABLES USED IN CNTROL AND THEIR USES.
C --- NCNT : TOTAL NO. OF ANIMALS IN ALL GROUPS.
C --- N : NO. OF ANIMAL FILE (7,8,9,10,AND 11).
C --- NREC1(11) : NO. OF ANIMALS IN EACH GROUP (FILES 7-11).
C --- M1 : VARIABLE COMMONED WITH MAIN PROGRAM TO DETERMINE TYPE LIST
C --- USER WANTS.
C --- ND1,ND2 : FILE UPDATE DATE IN FORM MM/DD/YY.
C --- NREC : NO. OF VEG. TYPES, KEY HAB. FAC.'S, ETC. IN FILE.
C --- S1 : VARIABLE COMMONED WITH MAIN PROGRAM AND LSTVT. S1=1=COMPLETE
C --- LIST OF VEG. TYPES. S1=WHOLE NO. PORTION OF HIERARCHY NO. GIVES
C --- SECTION OF LIST.
   NCNT=0
   DO 1 N=7,11
     READ (N'1,2) NREC1(N)
2   FORMAT (I5,75X)
     NCNT=NCNT+NREC1(N)
1   CONTINUE
   GO TO (10,20,10,10,10,40,40,50,60,40,40),M1
C --- LIST VEG. TYPES, KEY HAB. FAC.'S, COUNTIES, FORESTS
C --- M2=12=VEG. TYPES M2=13=KEY HAB. FAC.'S M2=16=COUNTIES
C --- M2=17=FORESTS
10 M2=12
   IF (M1.EQ.4) M2=17
   IF (M1.EQ.3) M2=16
   IF (M1.EQ.5) M2=13
   READ (M2'1,13) NREC12,ND1,ND2

```

```

13 FORMAT (I6,2A4,67X)
   NREC=(NREC12-1)/31
   WRITE (6,12) NREC,M2,ND1,ND2
12 FORMAT (1H0,'THERE ARE ',I4,' ITEMS IN FILE ',I2,'. LAST UPDATE WA
1S : ',2A4,/)
   IF (M2.NE.12) GO TO 30
   WRITE (6,31)
31 FORMAT (1X,'ENTER WHOLE NO. PORTION OF HIERARCHY NO. OF SERIES OF
1VEG. TYPES TO BE LISTED.',/)
   READ (5,32) S1
32 FORMAT ( )
30 CALL LISTVT (NREC12,M2)
   RETURN
C --- LIST ANIMALS
20 WRITE (6,21)
21 FORMAT (1H0,'ENTER GROUP NO. ',/,
1 10X,'1 = AMPHIBIANS',/,
2 10X,'2 = BIRDS',/,
3 10X,'3 = FISH',/,
4 10X,'4 = MAMMALS',/,
5 10X,'5 = REPTILES',/)
C --- M2=1=AMPHIBIANS M2=2=BIRDS M2=3=FISH M2=4=MAMMALS M2=5=REPTILE
   READ (5,22) M2
22 FORMAT ( )
   M2=M2+6
C ---NREC=NO. OF ANIMALS IN FILE ND1,ND2=UPDATE DATE
   READ (M2'1,23) NREC,ND1,ND2
23 FORMAT (I5,2A4,67X)
   WRITE (6,12) NREC,M2,ND1,ND2
   CALL LSTSIG (NREC,M2)
   RETURN
C --- LIST ANIMALS IN VEG. TYPE, KEY HAB. FAC., ETC. BY SELECTED GROUP.
40 M2=12
   IF (M1.EQ.6) M2=13
   IF (M1.EQ.10) M2=16
   IF (M1.EQ.11) M2=17
   WRITE (6,41)
41 FORMAT (1H0,'ENTER THE INDEX NO. OF FACTOR, TYPE, COUNTY OR FOREST
1 AND ANIMAL GROUP NO.',/)
C --- M3=VEG. TYPE, KEY HAB. FAC., ETC. INDEX NO.
C --- R1=ANIMAL GROUP NO.
   READ (5,22) M3,R1
   CALL LSTSIV (M3,M2)
   RETURN
C --- LIST MANAGEMENT INFO.
50 WRITE (6,53)
53 FORMAT (1H0,'ENTER GROUP NO. AND SPECIES NO. ',/)
C --- M5,M6=GROUP NO. AND SPECIES NO.
   READ (5,22) M5,M6
114 WRITE (6,115)
115 FORMAT (1X,'ENTER NO. OF CODES AND CODE NO.S FROM FOLLOWING LIST F
1OR INFO. NEEDED.',/,
2 8X,'CODES',/,10X,'0 = NONE',/,10X,'1 = GENERAL DISTRIBUTION',/
3 10X,'2 = PROTECTION STATUS',/,10X,'3 = VEGETATION TYPES',/,
4 10X,'4 = FOOD HABITS',/,10X,'5 = COVER REQUIREMENTS',/,
5 10X,'6 = KEY HABITAT FACTORS',/,10X,'7 = MANAGEMENT PRACTICES',
6 /,10X,'8 = ALL',/)

```

```

C --- N=NO. OF CODES,(R(I),I=1,8)=CODES.
      READ (5,22) N,(R(I),I=1,N)
      CALL MNGING (N,M5,M6,NCNT)
      RETURN
C --- LIST REFERENCES.
      60 WRITE (6,53)
C --- M11,M12=GROUP NO. AND SPECIES NO.
      READ (5,22) M11,M12
      CALL MNREF (M11,M12,NCNT)
      RETURN
      END

```


Appendix F

Since any of the 11 files providing data for PROGRAM RUN WILD may be unloaded, archived, or possibly even destroyed completely, depending on the ability of the user to keep his files accessible on a given system, the user should consider whether he wants tape files, which he can load into the disc files before running PROGRAM RUN WILD, or disc files, whose status he may have to check before running. If RUN WILD isn't going to be used daily, the user might prefer the tape file.

The user wanting to create an element on a UNIVAC 1100 series computer that would load the 11 tape files to 11 disc files could use the attached run stream to create the element. It would assume the existence of the 11 files on tape and in the order

| Sequence No. on Tape | File No. | File Name |
|-------------------------|----------|----------------------------|
| 1 | 12 | Vegetation types |
| 2 | 13 | Key habitat factors |
| 3 | 7 | Amphibians |
| 4 | 8 | Birds |
| 5 | 9 | Fish |
| 6 | 10 | Mammals |
| 7 | 11 | Reptiles |
| 8 | 14 | Management information |
| 9 | 15 | Bibliographical references |
| 10 | 16 | Counties |
| 11 | 17 | Forests |

The element called Q*F could be executed by doing an:

@ADD Q*F.ELT

prior to running PROGRAM RUN WILD. The user would have to wait until the execution is complete to run RUN WILD. In any case if the 11 files are not loaded to disc the program will not run.

COMMENTS (NOT PART OF CARDS)

@ASG,UP Q*F//WK.
@ED,I Q*F.ELT

ASSIGN & CATALOGUE A FILE TO STORE ELT
USE THE EDITOR TO CREATE Q*F.ELT

MSCHAR

BLANK CARD
USE / FOR @
BLANK CARD

/ASG,T TQ*TF.,20N,USER NO.
/USE 20.,TQ*TF.

ASSIGN TAPE CONTAINING RUNWILD FILES
USE UNIT NO. 20 FOR TQ*TF.

/ASG,T 12.,F///256
/ASG,T 13.,F///256

/ASG,T 7.
/ASG,T 8.
/ASG,T 9.

/ASG,T 10.
/ASG,T 11.

ASSIGN DISK SPACE FOR RUNWILD FILES

/ASG,T 14.,F///999
/ASG,T 15.,F///999

/ASG,T 16.,F///256
/ASG,T 17.,F///256

/COPY,G 20.,12.
/COPY,G 20.,13.

/COPY,G 20.,7.
/COPY,G 20.,8.

/COPY,G 20.,9.
/COPY,G 20.,10.

/COPY,G 20.,11.
/COPY,G 20.,14.

/COPY,G 20.,15.
/COPY,G 20.,16.

/COPY,G 20.,17.
/FREE

COPY THE RUNWILD FILES FROM TAPE TO DISK

@EOF

RECORDS WITH SLASHES MAKE UP Q*F.ELT



Casner, Wilson B., Barbara Kulongowski, David R. Patton, and Sandra J. Pinkerton. 1978. RUN WILD—For the UNIVAC 1100 Series, Implementation and maintenance. USDA For. Serv. Gen. Tech. Rep. RM-51A, 31 p. Rocky Mt. For. and Range. Exp. Stn., For. Serv., U.S. Dep. Agric., Fort Collins, Colo. 80526.

RUN WILD is a storage and retrieval system designed for wildlife habitat information in Arizona and New Mexico. Program language is UNIVAC FORTRAN V. The system contains programs to create and update 11 wildlife files. Minimal knowledge of computers is required to implement the system, and little training is necessary for the user to access the files. Disc files which allow large storage space and direct addressing of records are used. The number of files, file sizes, and file structures are set.

Casner, Wilson B., Barbara Kulongowski, David R. Patton, and Sandra J. Pinkerton. 1978. RUN WILD—For the UNIVAC 1100 Series, Implementation and maintenance. USDA For. Serv. Gen. Tech. Rep. RM-51A, 31 p. Rocky Mt. For. and Range. Exp. Stn., For. Serv., U.S. Dep. Agric., Fort Collins, Colo. 80526.

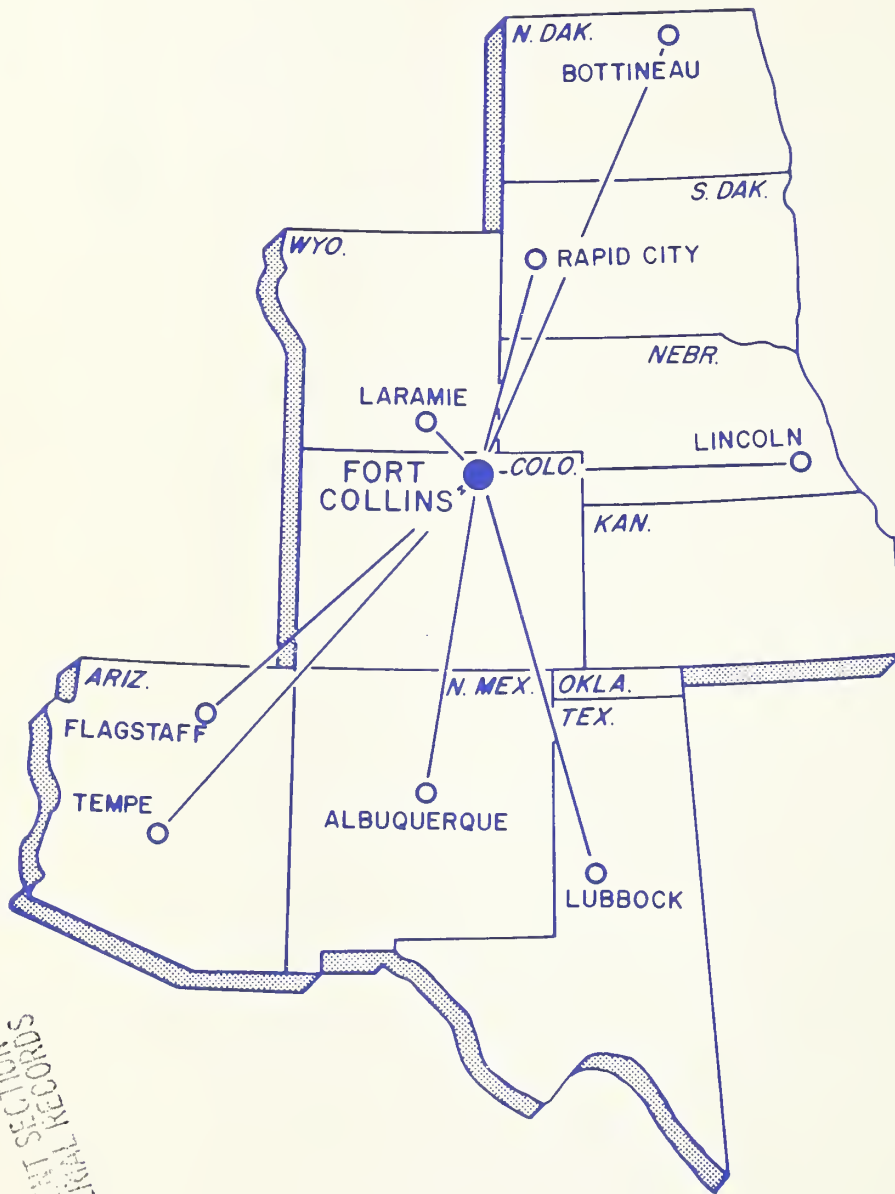
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